

1 We claim:

1. A wall designed to resist lateral forces imposed on a building incorporating said wall, said building having an underlying structural component supporting said wall, said wall comprising:

5 a bottom plate resting on said underlying structural component of said building;

b. means for connecting said bottom plate to said underlying structural component of said building;

c. a plurality of vertically-disposed studs resting on said bottom plate;

10 d. means for connecting said plurality of vertically-disposed studs to said bottom plate;

e. a top plate resting on said vertically-disposed studs;

f. means for connecting said top plate to said vertically-disposed studs;

15 g. a shear-resisting assembly connected to said top plate and also connected to said underlying structural component and disposed between said top plate and said underlying structural component, said shear-resisting assembly including,

20 1. a planar shear-resisting element, said planar shear-resisting element having a proximal face and a distal face, a top edge, a bottom edge and first and second side edges, said shear-resisting assembly also including,

2. a top strut connected to said proximal face near said top edge of said shear-resisting element, and disposed substantially

25 parallel to said top plate of said wall,

3. a bottom strut connected to said proximal face near said bottom edge of said shear-resisting element,

4. a first chord connected to said proximal face near said first side edge of said shear-resisting element,

30 5. a second chord connected to said proximal face near said second side edge of said shear-resisting element, and

6. means for connecting said top strut, said bottom strut, said first chord and said second chord to said shear-resisting element.

35 said top and bottom struts and said first and second chords forming a supporting frame for said shear-resisting element;

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- 1 h. means for connecting said shear-resisting assembly to said top plate of said wall; and
i. means for connecting said shear-resisting assembly to said underlying structural component of said building.

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2. The wall of claim 1, wherein:

- a. said means for connecting said bottom plate to said underlying structural component of said building is a foundation anchor;
b. said means for connecting said plurality of vertically-disposed studs to said bottom plate are nails;
c. said means for connecting said top plate to said vertically-disposed studs are also nails;
d. said means for connecting said top strut, said bottom strut, said first chord and said second chord to said shear-resisting element are nails;
e. said means for connecting said shear-resisting assembly to said top plate of said wall are top plate fasteners having a threaded shank portion; and
f. said means for connecting said shear-resisting assembly to said underlying structural component of said building is foundation anchor.

3. The wall of claim 1, wherein:

said shear-resisting assembly rests directly on said underlying structural component.

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4. The wall of claim 3, wherein:

said first and second chords of said shear-resisting assembly rest directly on said underlying structural component.

30 5. The wall of claim 1, wherein:

said means for connecting said shear-resisting assembly to said underlying structural component is a foundation anchor anchored to said underlying structural component, said foundation anchor being designed to transmit lateral forces imposed on said underlying structural component to said shear-resisting assembly.

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- 1 6. The wall of claim 5, wherein:
said bottom strut is formed with an opening through which said foundation anchor passes.
- 5 7. The wall of claim 6, wherein:
said opening in said bottom strut is oversized to accommodate mis-installation of said foundation anchor in said underlying structural component.
- 10 8. The wall of claim 6, wherein:
said opening in said bottom strut is a slotted opening, said slotted opening being oriented so that said bottom strut can slide horizontally and at right angles to the length of said wall.
- 15 9. The wall of claim 6, wherein:
said opening in said bottom strut is a notch in said bottom strut that allows said bottom strut to slide into place.
- 20 10. The wall of claim 7, 8 or 9, further comprising:
epoxy within said opening in said bottom strut to ensure close contact between said foundation anchor and said bottom strut.
- 25 11. The wall of claim 6, further comprising:
a. a toothed plate, having teeth, that receives said foundation anchor and connects to said bottom strut with said teeth; and
b. a nut fitted onto said foundation anchor that forces said teeth of said toothed plate into said bottom strut.
- 30 12. The wall of claim 11, wherein:
said opening in said bottom strut is oversized to accommodate mis-installation of said foundation anchor in said underlying structural component.
- 35 13. The wall of claim 11, wherein:

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- 1 said opening in said bottom strut is a slotted opening, said slotted opening being oriented so that bottom strut can slide horizontally and at right angles to the length of said wall.
- 5 14. The wall of claim 12, wherein:
 said opening in said bottom strut is a notch in said bottom strut that allows said bottom strut to slide into place.
- 10 15. The wall of claim 1, further comprising:
 a. first and second anchor bolts that are anchored to said underlying structural component and are disposed near said first and second chords;
 b. first and second holdowns that receive said first and second anchor bolts;
 c. nuts that are fitted on said first and second anchor bolts and engage said first and second holdowns; and
 d. means for connecting said first and second holdowns to said first and second chords.
- 15 20 16. The wall of claim 15, wherein:
 said bottom strut is formed with anchor bolt openings through which said first and second anchor bolts pass.
- 25 17. The wall of claim 16, wherein:
 said anchor bolt openings in said bottom strut are oversized to accommodate mis-installation of said first and second anchor bolts in said underlying structural component.
- 30 18. The wall of claim 16, wherein:
 said anchor bolt openings in said bottom strut are slotted openings, said slotted openings being oriented so that said bottom strut can slide horizontally and at right angles to the length of said wall.
- 35 19. The wall of claim 17, wherein:
 said anchor bolt openings in said bottom strut are notches in said bottom strut that allow said bottom strut to slide into place.

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20. The wall of 18, wherein:

said first and second holdowns are formed with slotted openings that are oriented in the same direction as, and are in general alignment with, said slotted openings in said bottom strut when said first and second holdowns are attached to said first and second chords, said slotted openings receiving said first and second anchor bolts.

21. The wall of claim 19, wherein:

- 10 a. said first and second holdowns are formed with slotted openings that are oriented in the same direction as, and are in general alignment with, said notches in said bottom strut, when said first and second holdowns are attached to said first and second chords, said slotted openings receiving said first and second anchor bolts; and
- 15 b. said first and second holdowns are formed with portals to allow said shear-resisting assembly to be slid into place.

22. The wall of claim 16, wherein:

- 20 said means for connecting said first and second holdowns to said first and second chords are holdown fasteners having a threaded shank portion.

23. The wall of claim 22, wherein:

- 25 said threaded fasteners are inserted only a selected distance into said first and second chords without passing all the way through said first and second chords.

24. The wall of claim 1, wherein:

- 30 said means for connecting said top strut, said bottom strut, said first chord and said second chord to said shear-resisting element are edge fasteners having shank portions.

25. The wall of claim 24, further comprising:

- 35 boundary edging members disposed on said shear-resisting element at said top and bottom edges and said first and second side edges that

1 are pierced by said shank portions of said edge fasteners and thereby strengthen the connection made by said edge fasteners.

26. The wall of claim 25, wherein:

5 said boundary edging members are u-shaped channels, having a pair of legs joined by a central member that embrace said shear-resisting element, each of said edge fasteners passing through each of said legs of said u-shaped channels.

10 27. The wall of claim 1, wherein:

said means for connecting said shear-resisting assembly to said top plate of said wall are top plate fasteners having a threaded shank portion.

15 28. The wall of claim 27, wherein:

said top plate fasteners are inserted through said top strut of said shear-resisting assembly and into said top plate of said wall.

20 29. The wall of claim 1, wherein said shear-resisting assembly further comprises:

- a. intermediate studs disposed between said top and bottom struts of said shear-resisting element; and
- b. means for connecting said intermediate studs to said top and bottom struts.

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30. The wall of claim 29, further comprising:

means for connecting said intermediate studs to said shear-resisting element.

30 31. The wall of claim 1, wherein:

said first and second chords of said shear-resisting assembly are formed from two elongated wood members, laminated together.

32. The wall of claim 1, wherein:

35 said shear-resisting element comprises a single structural panel.

1 38. The wall of claim 1, wherein:
said shear-resisting element comprises a plurality of adjoining
structural panels disposed in a single plane, forming joints between
said structural panels.

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34. The wall of claim 33, wherein said shear-resisting assembly further
comprises:

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- a. intermediate studs disposed between said top and bottom struts of
said shear-resisting element;
- b. means for connecting said intermediate studs to said top and
bottom struts;
- c. means for connecting said intermediate studs to said structural
panels; and

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wherein selected intermediate studs are disposed at said joints of said
structural panels, serving to connect said structural panels together.

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